BEFORE THE

Federal Communications Commission

WASHINGTON, D. C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of	)	
	)	
Advanced Television Systems and Their Impact upon the Existing Television Broadcast Service	)	MM Docket 87-268

To: The Commission

COMMENTS OF THE COUNTY OF LOS ANGELES, CALIFORNIA

The County of Los Angeles, California ("County") hereby submits the following comments in response to the Commission's Second Further Notice of Proposed Rulemaking ("Second Further Notice") in the above-captioned proceeding regarding proposed UHF channel allotments for Advanced Television ("ATV") stations, FCC 92-332, released August 14, 1992.

The County is the licensee of a 55 channel public safety land mobile radio communications system operating on UHF Channel 16 frequencies, and a mobile data communications system operating on UHF Channel 14 frequencies,[1/] which provide the vast majority of mobile and portable radio communications for the Los Angeles County Sheriff's Department. UHF Channels 14 and/or 16 frequencies are also used by the Los Angeles County Fire Department, the City of

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[1/] These UHF frequencies are available for land mobile use pursuant to Part 90, Subpart L, of the Commission's rules. 47 C.F.R. §90.301, et seq.

Los Angeles Police and Fire Departments, and the cities of Burbank, Glendale, Whittier, Redondo Beach, South Bay, Santa Monica, Alhambra, Culver City, Montebello, and Pasadena, California for their public safety communications systems.

The Commission's proposal includes ATV allotments of (a) UHF Channel 16 in San Diego, which is short-spaced to co-channel UHF Channel 16 land mobile facilities in the Los Angeles area, (b) UHF Channel 15 in Riverside, California, which is "short-spaced" to adjacent-channel land mobile facilities in Los Angeles operating on both UHF Channels 14 and 16, and (c) UHF Channel 69 in Los Angeles, which would be adjacent to land mobile communications facilities in the 806-890 MHz band. Second Further Notice at D-38. These ATV allotments, if adopted, would cause serious and destructive interference to vital public safety radio operations.

Channel 16, San Diego

This is the only proposed ATV allotment that is short-spaced to co-channel land mobile operations. Second Further Notice at ¶47. The site of the proposed ATV Channel 16 in San Diego is on Mt. Soledad (site 2), just 102 miles from the geographic center of Los Angles, and only 73 miles from the nearest Channel 16 base station licensed to the

County.[2/] The Commission's proposed new "standard" mileage separation between ATV stations and co-channel land mobile operations is 155 miles. Second Further Notice at ¶46. This proposed ATV allotment poses a serious danger of interference to the Sheriff's communications system, so much so that much of it would be rendered useless.[3/] Other public safety entities using Channel 16 frequencies in Southern California would be similarly impacted.

Indeed, the potential for interference is so great that it is difficult to understand how the Commission could have even contemplated this co-channel allotment. The situation is made even worse by the well-established "ducting" phenomenon which occurs along the coast of Southern California,[4/] and the fact that much of the transmission path between the proposed ATV site and Los Angeles is over water. Of particular concern are the Sheriff's base stations on Catalina Island, a direct over-water path to

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[2/] At least six of the County's UHF Channel 16 base stations are located less than 100 miles from the proposed ATV site in San Diego (See Table 1, attached hereto).

[3/] See also Comments of the Land Mobile Communications Council ("LMCC") and Comments of Associated Public-Safety Communications Officers, Inc. ("APCO").

[4/] See Report and Order in PR Docket 82-244, 56 RR2d 1352, 1354, n.10 (1984)(indicating that preliminary Commission analysis of ducting in Southern California demonstrated enhanced field measurements of 20 dB or more for a significant period of the year).

San Diego.[5/] Many of the other Sheriff's Department base stations are located on mountaintops overlooking the Los Angeles Basin, which would also allow a "barrier-free" transmission path from Mt. Soledad in San Diego.

The County of Los Angeles Internal Services Department (ISD) has conducted an engineering study, attached as Appendix B, calculating the field strength of existing San Diego UHF television signals at six of the County's base stations in the Los Angeles area. The study leaves little doubt than an ATV station in San Diego would cause serious and destructive interference to the County's vital public safety communications systems. The Comments of LMCC, at Appendix C, reach a similar conclusion.

Finally, the proximity of the proposed San Diego ATV site to high elevation, co-channel land mobile transmitters in Los Angeles suggests that there would also be significant interference to (not just from) the ATV signal.[6/]

Channel 15, Riverside, California

The proposed ATV allotment of UHF Channel 15 to Riverside poses a danger of interference to both UHF Channel 14 and UHF Channel 16 land mobile operations in Los Angeles.

[5/] The County's Channel 16 receiving equipment use highly sensitive Distributed Gain GaAs FET Receiver Couplers, which would further increase the likelihood that undesired co-channel and adjacent channel signals will cause interference.

[6/] On several occasions, County personnel have been in the San Diego area with their mobile and/or portable radios and have been able to hear UHF Channel 16 base station transmissions from Los Angeles without difficulty.

The proposed ATV site for Riverside is actually located within Los Angeles County, on Sunset Ridge. This site is just 32.4 miles from the geographic center of Los Angeles, well within the 50-mile radius in which land mobile use of UHF Channels 14 and 16 is authorized.[7/] Indeed, the County also operates UHF Channel 14 and 16 communications facilities on Sunset Ridge, just 0.334 miles from the proposed ATV site.[8/] Therefore, to call this ATV allotment "short-spaced" is a gross understatement. It is, in effect, co-located with land mobile operations. Furthermore, the ATV site is on a mountain ridge overlooking most of the Los Angles Basin, significantly increasing the likelihood of interference to adjacent channel operations.

Appendix A, attached hereto, contains a technical analysis of the likelihood for interference to the County's land mobile operations from an adjacent-channel ATV station at the proposed site. The study shows a signal strength received at the land mobile site which far exceeds that which would cause destructive interference.[9/]

[7/] 47 C.F.R. §90.305.

[8/] Other nearby sites licensed to the County are 6.0, 10.3, and 11.4 miles from the proposed ATV site. (See Table 4.)

[9/] In the recent past, the County's UHF Channel 16 operations have experienced isolated interference from existing UHF television Channel 18, San Bernardino, due to problems (which have since been corrected) in the Channel 18 transmitting equipment. The County is concerned that, even if adjacent channel ATV operations were theoretically possible, similar real life problems could arise, causing dangerous interference to the County's public safety communications systems.

Channel 69, Los Angeles

The County, and many other public safety agencies, are licensed to operate land mobile radio operations in the 806-890 MHz band, which is immediately adjacent to UHF Channel 69. The Commission's current rules impose limits on the field strength of television stations operating on UHF Channels 69 and 14 (which is adjacent to land mobile operations in the 450-470 MHz band) to prevent harmful interference to pre-existing adjacent channel land mobile operations.[10/] These guidelines generally prevent Channel 14 or 69 from being used for television stations in close proximity to adjacent channel land mobile facilities. Therefore, the County questions the feasibility of the allotment of Channel 69 for Los Angeles, since adjacent-channel land mobile facilities (including those of the County) are licensed for locations throughout the Los Angeles area.

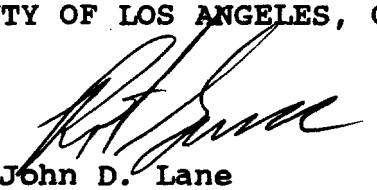
[10/] 47 C.F.R. § 73.687(b)(3) and (4).

CONCLUSION

For the reasons discussed above and in the attached engineering analysis, the Commission must revise its proposed ATV table of allotments to prevent interference to the County's public safety land mobile operations.

Respectfully submitted,

COUNTY OF LOS ANGELES, CALIFORNIA

By: 

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Appendix A

County of Los Angeles
Comments on Proposed ATV Channel 15
Operation at Sunset Ridge

Summary

Analysis by ISD Radio Systems Division (RSD) indicates that the ATV Channel station proposed for adjacent-channel operation at Sunset Ridge will adversely affect the Los Angeles County Sheriff's Department's (LASD's) and L.A. County Fire Department's UHF radio systems operating on TV Channels 14 and 16. The most severely affected will be the County's Sunset Ridge site, located one-third of a mile from the proposed station.

Discussion

Paragraph 46, Land Mobile Sharing Channels, of the FCC's Second Further Notice of Proposed Rule Making states the need to protect against possible interference between ATV stations and land mobile (LM) operations on TV broadcast frequencies in certain areas. The FCC believes it possible to allow ATV stations to operate at adjacent-channel spacings to the city-center of LM operations as close as 110 miles. The Commission requests comment on whether this shorter spacing standard would adequately protect against interference between LM operations and ATV stations.

According to a listing on page D-38 of a proposed "first draft" ATV Table, ATV Channel 15 will be assigned to Riverside, California. The listing notes that the channel is adjacent to TV Channels 14 and 16 used for LM operation in Los Angeles County.

According to more specific information, it appears that the Riverside site is nearly co-located with the County's Sunset Ridge site, which houses LASD radio systems equipment operating on Channels 14 and 16. The proposed Riverside site's coordinates are latitude: 34 deg. 11 min. 16 sec., longitude: 117 deg. 41 min. 55 sec. The County's site is at latitude: 34 deg. 11 min. 17 sec., longitude: 117 deg. 42 min. 16 sec.

The distance between the two sites is 0.334 miles. Although the FCC notes in paragraph 47 that "the draft Table does include five cases where ATV allotment would be located at distances less than 110 miles from the city-center of an adjacent channel land mobile system", the exceedingly short distance between the two sites in this case most likely was not considered.

Using the formula: path attenuation (dB) = 36.6 + 20 log f(MHz) + 20 log d(miles), ref. page 28-19, Reference Data for Engineers, the free-space attenuation for 0.334 mi. at 479 MHz (mid-band of Channel 15) is calculated to be 80.7 dB. Assuming that the effective radiated power (ERP) of the proposed ATV station is 2

Megawatt (equivalent to +63 dBW), a signal level of -17.7 dBW is expected at the County's site. This is equivalent to a field strength of 140.9 dB (uV/m), exceeding by 56.9 dB the typically accepted 84 dB (uV/m) level of adjacent-channel interference at an LM base-station receiver.

It appears that the operative phrase is "distance from the city-center".

The geographic center of Los Angeles (as listed on page 369 of FCC Rules and Regulations, Part 90) is latitude: 34 deg. 03 min. 15 sec., longitude: 118 deg. 14 min. 28 sec. The distance between the geographic center and the proposed ATV site is 32.4 miles. Assuming that the terms "city-center" and "geographic center" are synonymous, even this distance is far shorter than the proposed short spacing of 110 miles.

Besides the County's Sunset Ridge site, seven other County mountaintop/hilltop, adjacent-channel sites are within a 32.4 mile radius of the proposed ATV site. (They are: Frost Peak, Johnstone Peak, Mt. Disappointment, Mt. Lukens, Puente Hills Nike, Rio Hondo and San Dimas.) Table 4 shows distance between these seven sites and the proposed ATV Channel 15 location. And three other lower-altitude sites (Downey, Altadena Sheriff's station and Temple City Sheriff's station) are within that radius. In addition, all of the remaining 42 LASD adjacent channel sites are within a 70-mile radius of the proposed ATV site.

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Appendix B

County of Los Angeles
Comments on Proposed ATV Channel 16
Operation in San Diego

Summary

ISD Radio Systems Division's (RSD) review of the proposal and analysis indicates ATV Channel 16 from San Diego will have detrimental effects on the Sheriff's and Fire Department's land-mobile radio systems.

Discussion

In FCC's Second Further Notice of Proposed Rule Making, two locations are listed as possible ATV Channel 16 transmit sites to serve the San Diego area. Site #1 is Soledad Mt. with coordinates of latitude: 32 deg. 50 min. 20 sec., longitude: 117 deg. 14 min. 56 sec. Site #2 is Mt. San Miguel with coordinates of latitude: 32 deg. 41 min. 47 sec., longitude: 116 deg. 56 min. 07 sec.

The Los Angeles County Sheriff's Department (LASD) currently has a 56-channel voice radio system using a portion of Channel 16. The County's Fire Department has its data radio system on another portion of Channel 16. The effects of ATV Channel 16 transmissions from San Diego are discussed below.

To determine the effects of ATV Channel 16 can have on the LASD and County's Fire Department communications systems, RSD first performed calculations based on available information on ATV Channel 16. To validate RSD's calculations, field strength measurments of KPBS Channel 15 from San Diego were taken and compared them with the calculated field strengths of Channel 15.

RSD calculated path losses between the two proposed ATV locations and LASD radio sites located in the southern portion of Los Angeles County. Based on the calculated path loss to each site, RSD calculated the expected ATV Channel 16 field strength at the receiver.

The selected radio sites are:

Abbv	Site Name	Latitude	Longitude
BJM	- Black Jack Mt.,	33-23-12 N	118-24-00 W
DPK	- Dakin Peak,	33-21-00 N	118-21-06 W
TWR	- Tower Peak,	33-25-46 N	118-28-38 W
SPH	- San Pedro Hills,	33-44-50 N	118-20-07 W
RHT	- Rolling Hills,	33-46-07 N	118-22-32 W
SCC	- Sheriff's Comm. Center,	34-03-12 N	118-10-28 W

The results of these calculations are shown in Tables 1 and 2. The calculations show that the field strength from ATV Channel 16 at LASD base-station receivers ranges from 40 to 73 dB above what is required for a base station receiver to obtain a 12-dB SINAD measurement.

We assumed a horizontal polarization of the ATV antenna. Cross-polarization isolation of 15 dB is included in the calculations.

RSD concludes in its first analysis that transmissions from ATV Channel 16 will cause unacceptable interference to LASD and County Fire Department's radio systems.

RSD performed a second analysis based on TV Channel 15 (KPBS) operating from Mt. San Miguel in San Diego County. Channel 15 was chosen because of its similarities in transmitter location, antenna main lobe orientation, effective radiated power (proposed ATV ERP is 10 dB below current NTSC-allowable ERP) and close proximity of operating RF spectrum with ATV Channel 16. Parameters for Channel 15 are as follows:

Visual Frequency - 477.25 MHz
Coordinates - Lat. 32-41-47 N, Long. 116-56-07 W
Effective Radiated Power - 3.02 MW
Antenna Orientation - NW
Polarization - horizontal

RSD calculated field strengths of Channel 15 at the above radio sites and compared them with actual measured field strengths.

The parameters for measurements are as follows:

Receive Antenna - Celwave PD755 or Motorola TDE-6091A
Receive Antenna Gain - 10 dBd
Receive Antenna RF Pattern - Omni-directional for PD755,
southeast for TDE-6091A
Receive Antenna Operating Frequency - 483 MHz to 487 MHz
Polarization - Vertical
Cross-Polarization Isolation - 15 dB
Cable/Connector Loss - see Table 3 for each specific site

Table 3 shows both the calculated and measured values of Channel 15. RSD found that the measured field strengths at these sites correspond closely to the calculated values. This validates the calculated values shown in Tables 1 and 2 for ATV Channel 16.

Use of either the calculated field strengths or measured field strengths indicates that the co-channel interference from ATV Channel 16 transmissions will override desired signals at these sites.

Even if ATV is operating at 10 dB below the current NTSC-allowable ERP, the undesired signal would be so strong that the 10 dB difference would be irrelevant.

Base on these analyses, RSD concludes that it will be highly unlikely for ATV Channel 16 to operate in the San Diego area without adversely and seriously affecting LASD and County Fire Department's communications systems.

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Attachments

TABLE 1

ATV CHANNEL 16 CALCULATED FIELD STRENGTHS

SITE: Soledad Mt.
LATITUDE: 32,50,20
LONGITUDE: 117,14,56
GROUND ELEVATION, Feet Amsl.: 695

SITE	BJM	DPK	TWR	SPH	RHT	SCC
LATITUDE	33-23-12 N	33-21-00 N	33-25-46 N	33-44-50 N	33-46-07 N	34-03-12 N
LONGTUDE	118-24-00 W	118-21-06 W	118-28-38 W	118-20-07 W	118-22-32 W	118-10-28 W
GROUND ELEV., Ft. AMSL	2010.00	1600.00	1220.00	1481.00	1198.00	590.00
RX ANTENNA HEIGHT, Ft, AGL	120.00	125.00	100.00	25.00	100.00	150.00
RX FREQUENCY, MHz	486.00	486.00	486.00	486.00	486.00	486.00
PATH LENGTH, MILE	76.60	72.90	81.90	88.70	91.40	99.40
CH 15 ERP, dBW	64.80	64.80	64.80	64.80	64.80	64.80
RX-ANTENNA GAIN, dBd	10.00	10.00	10.00	10.00	10.00	10.00
FREE-SPACE LOSS, dB	128.20	127.59	128.60	129.29	129.55	130.28
OBSTRUCTION LOSS, dB	3.10	2.50	22.60	0.60	24.90	23.60
RX-CABLE/CONNECTOR LOSS, dB	3.00	3.00	3.00	1.00	3.00	3.00
CROSS-POLARIZATION ISOLATION, dB	15.00	15.00	15.00	15.00	15.00	15.00
CALCULATED RECEIVE LEVEL, dBuV/m	84.23	85.44	64.33	87.64	61.08	61.65
RECEIVER 12dB-SINAD THRESHOLD, dBuV/m	12.73	12.73	12.73	12.73	12.73	12.73
UNDESIRED SIGNAL ABOVE RECEIVER 12-dB-SINAD THRESHOLD, DB	71.5	72.71	51.6	74.91	48.35	48.92

TABLE 2

ATV CHANNEL 16 CALCULATED FIELD STRENGTHS

SITE: Mt. San Miguel
LATITUDE: 32,41,47
LONGITUDE: 116,56,07
GROUND ELEVATION, Feet Amsl.: 2545

SITE	BJM	DPK	TWR	SPH	RHT	SCC
LATITUDE	33-23-12 N	33-21-00 N	33-25-46 N	33-44-50 N	33-46-07 N	34-03-12 N
LONGTUDE	116-24-00 W	116-21-06 W	116-28-38 W	116-20-07 W	116-22-32 W	116-10-28 W
GROUND ELEV., Ft. AMSL	2010.00	1600.00	1220.00	1481.00	1198.00	590.00
RX ANTENNA HEIGHT, Ft, AGL	120.00	125.00	100.00	25.00	100.00	150.00
RX FREQUENCY, MHz	486.00	486.00	486.00	486.00	486.00	486.00
PATH LENGTH, MILE	97.30	93.60	102.60	108.70	111.40	117.90
CH 15 ERP, dBW	64.80	64.80	64.80	64.80	64.80	64.80
RX-ANTENNA GAIN, dBd	10.00	10.00	10.00	10.00	10.00	10.00
FREE-SPACE LOSS, dB	129.94	129.60	130.40	130.90	131.11	131.61
OBSTRUCTION LOSS, dB	0.00	0.50	23.30	1.40	14.80	31.20
RX-CABLE/CONNECTOR LOSS, dB	3.00	3.00	3.00	1.00	1.00	3.00
CROSS-POLARIZATION ISOLATION, dB	15.00	15.00	15.00	15.00	15.00	15.00
CALCULATED RECEIVE LEVEL, dBuV/m	85.59	85.43	61.83	85.23	71.62	52.72
RECEIVER 12dB-SINAD THRESHOLD, dBuV/m	12.73	12.73	12.73	12.73	12.73	12.73
UNDESIRED SIGNAL ABOVE RECEIVER 12-dB-SINAD THRESHOLD, DB	72.86	72.7	49.1	72.5	58.89	39.99

TABLE 3 **CALCULATED AND MEASURED FIELD STRENGTHS FOR KPBS CHANNEL 15**

SITE: Mt. San Miguel
LATITUDE: 32,41,47
LONGITUDE: 116,56,07
GROUND ELEVATION, Feet Amsl.: 2545

SITE	BJM	DPK	TWR	SPH	RHT	SCC
LATITUDE	33-23-12 N	33-21-00 N	33-25-46 N	33-44-50 N	33-46-07 N	34-03-12 N
LONGTUDE	116-24-00 W	116-21-06 W	116-26-38 W	116-20-07 W	116-22-32 W	116-10-28 W
GROUND ELEV., Ft. AMSL	2010.00	1600.00	1220.00	1481.00	1196.00	590.00
RX ANTENNA HEIGHT, Ft, AGL	120.00	125.00	100.00	5.00	100.00	150.00
RX FREQUENCY, MHz	477.25	477.25	477.25	477.25	477.25	477.25
PATH LENGTH, MILE	97.30	93.60	102.60	108.70	111.40	117.90
CH 15 ERP, dBW	64.80	64.80	64.80	64.80	64.80	64.80
RX-ANTENNA GAIN, dBd	10.00	10.00	10.00	10.00	10.00	10.00
FREE-SPACE LOSS, dB	129.94	129.60	130.40	130.90	131.11	131.61
OBSTRUCTION LOSS, dB	0.00	0.50	20.00	6.00	14.80	29.90
RX-CABLE/CONNECTOR LOSS, dB	3.00	3.00	3.00	1.00	3.00	3.00
CROSS-POLARIZATION ISOLATION, dB	15.00	15.00	15.00	15.00	15.00	15.00
CALCULATED RECEIVE LEVEL, dBuV/m	85.43	85.27	64.97	80.47	69.46	53.86
MEASURED RECEIVE LEVEL dBuv/m	79.57	80.57	52.57	76.57	62.57	58.57
DIFFERENCE (MEASURED - CALCULATED), dB	-5.86	-4.7	-12.4	-3.9	-6.89	4.71

TABLE 4 DISTANCE BETWEEN ATV CH15 TO COUNTY RADIO SITES
SITE: SUNSET RIDGE
LATITUDE: 34-11-16
LONGITUDE: 117-41-55

SITE	LATITUDE	LONGITUDE	d, mile
FROST PEAK	34-21-07	117-40-25	11.4
JOHNSTONE PEAK	34-09-37	117-47-53	6.0
MT. DISAPPOINTMENT	34-14-48	118-06-14	23.5
MT. LUKENS	34-16-07	118-14-08	31.2
PUENTE HILLS NIKE	33-57-20	117-53-39	19.6
RIO HONDO	34-01-02	118-00-49	21.5
SAN DIMAS	34-04-18	117-48-46	10.3
VERDUGO PEAK	34-13-03	118-16-56	33.4